

**SPACE-FREQUENCY  
CODING FOR MIMO SYSTEMS**

**ABSTRACT OF THE DISCLOSURE**

[0079] A transceiver in an NxN MIMO (Multiple-In-Multiple-Out) system includes a mode selection module to select a spatial multiplexing rate and a coding module to space frequency code OFDM (Orthogonal Frequency Division Multiplexing) symbols in response to the selected spatial multiplexing rate. The coding module maps data symbols to the transmit antennas for all data tones in the OFDM symbol. The tones may be mapped using different mapping permutations, which may be applied to the tones in a cyclical manner.